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The use of elm timber

As a result of the ravages of Dutch elm disease there will be at least twice as much good quality elm saw timber available during the next five years as the market was absorbing in 1975. There will also be large quantities of smaller and lower quality trees which could be used for other purposes. Although all dead trees deteriorate after a time, elm disease itself has no effect whatsoever on the wood properties.

Properties

Although there are many species and hybrids of elm in Britain, with the exception of wych elm their wood properties are generally similar and can be conveniently described together.

Elm is a wood of moderate strength and medium weight, pale brown in colour when dried, and with distinct annual rings due to large spring-wood pores. It is frequently cross-grained and of irregular growth, producing an extremely attractive figure, making it one of the most handsome of British hardwoods. This same feature, however, can limit its use where strength properties are important. For load-bearing uses, straight-grained wood is selected or the difficulty overcome by use of larger sections. Some wych elm is available. It is heavier and stronger than the other British elms and is also generally straighter-grained and more finely-textured.

Elm dries fairly rapidly, but where cross-grain is present distortion is likely to occur in the smaller sizes. This can be reduced by careful piling of the sawn wood with closely-spaced stickers, and applying weights to the top of the stack. Wych elm is less susceptible to distortion in drying.

The wood can be worked readily by machine and hand tools and can be given a good finish. Polishing produces a fine lustre. Nailing and gluing properties are quite satisfactory, and a particular advantage of elm is its ability to hold nails without splitting. Straight grained material has excellent bending properties. The heartwood of elm is classed as non-durable* and is moderately resistant to preservatives, but satisfactory penetration can be obtained by pressure treatment. The sapwood, in common with most species, is perishable but can be easily treated with preservatives.

* For approximate, comparative purposes, timbers are classified into five broad grades of durability, based on the performances of their heartwood in ground contact—very durable; durable; moderately durable; non-durable; perishable. The category "non-durable" indicates that untreated heartwood could have an approximate life of 5–10 years in ground contact.

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Technical enquiries arising from this Digest should be directed to Building Research Advisory Service at the above address.

Uses

Internal joinery Where a decorative wood is required, properly selected elm, dried to the appropriate moisture content, can be used for internal joinery.

Furniture Selected elm is a popular wood for furniture manufacture, especially for cabinet work, chairs and settee frames, and is traditionally the preferred timber for Windsor chair seats. Load-bearing members of elm furniture are, however, often made of beech. Some elm furniture and door and wall panelling is produced from sliced veneers, and at least one company produces large areas for table tops and sideboards by bonding smaller boards together.

Flooring If carefully selected after kiln drying to the appropriate moisture content, elm can produce an attractive domestic floor and is best used as blocks. It is not suitable for heavy-duty flooring, such as in factories, mills, warehouses, etc.

Civil engineering Sawn elm, if necessary treated with preservative, is suitable for river and sea defence works. It is also used for excavator mats and for trench linings and rough boarding. Sawn to large sizes, elm could be used in building and road works where timber is used for temporary barriers, boundaries for walkways and protection of cladding at ground level from traffic, plant, pedestrians etc.

Docks and harbours Elm is used for keel blocks, cappings, wedges, fenders and rubbers.

Weather boarding Elm has been used extensively in the past as weather boarding for farm buildings, cabins, shelters and similar uses, and sometimes in housing. Selection of timber to exclude sloping grain is necessary to avoid the possibilities of distortion.

Fencing Round elm, given appropriate preservative treatment, is suitable for fence and gate posts, and straight-grained, preservative-treated elm is suitable for fencing rails.

Veneer Elm can be sliced to produce decorative veneers.

Pallets, stillages, boxes and packing cases The good nail-retention and screw-holding properties make elm a useful wood for the bearer blocks of pallets and the runners of stillages, as well as the corners of boxes and crates.
If used for the packaging of heavy goods, careful selection is necessary to avoid the inclusion of boards and battens with steeply sloping grain.

Mining timber Sawn mining timber is a good outlet for the lower qualities of sound elm.

Garden furniture Good widths of elm which are free from dead knots and large live knots are suitable for the manufacture of garden tables and benches.

Wood turning A small amount of elm is used in ornamental turnery for the production of such articles as fruit bowls and pin-trays. Wych elm gives a better finish and is usually preferred.

Farming With modern preservative treatment elm can be used for the frames of farm buildings, and bas barriers for silage and sewage slurry. Elm chippings and sawdust can be used as deep litter for cattle and poultry; all material used for poultry litter, whether of elm or any other species, should be air-dry so as to avoid the development of moulds.

The wider use of elm

Data from surveys of dead elms, from the Forestry Commission and other sources, suggest a tentative analysis along the following lines:

Twenty-eight per cent of the trees, containing *fifty-seven per cent* of the volume, are in a size category generally regarded as suitable for sawmilling (i.e. 30 cm or greater diameter at breast height with a good length of clean bole).

There are promising marketing possibilities for materials in this category by replacement of other timbers (including softwoods) for such purposes as internal joinery, temporary fencing, mining timber, civil engineering, packaging and materials handling. Much of the material would also be suitable for the limited, higher grade markets such as furniture and joinery.

Eighteen per cent of the trees, containing *twenty-eight per cent* of the volume, are of a diameter suitable for sawmilling but have shorter boles with low branching which may present utilisation problems.

It is more difficult to find uses for materials in this category because of poorer internal and external quality. However, when strength is not a prime requirement, there are opportunities, depending on quality, in certain civil engineering and marine applications (preferably in large dimensions), and also for mining timber and estate uses.

Fifty-four per cent of the trees, containing *fifteen per cent* of the volume, are of a diameter lower than that generally accepted for sawmilling irrespective of quality.

Storage

Standing trees The available evidence suggests that trees which are sound at the time of death remain sound for at least two years, but there is likely to be significant deterioration within three or four years after death. Early felling is necessary where the tree, and in particular its branches, constitutes a danger or where it is in the vicinity of other elms not affected by the disease. The appearance of fungal fruiting bodies is an indication that the tree is already seriously affected by decay.

Logs There is no evidence that felled logs will last any longer than standing trees. Logs stored in water will remain sound for many years, but owing to the costs involved, this method of storage is only likely to be economic for high quality logs.

Sawn timber The best method of preventing deterioration is to store the timber as sawn boards. Since this involves tying up capital, as well as storage maintenance costs, this form of storage is only an economic proposition for high quality timber. The boards should be well stacked to minimise distortion during drying. Clean dry sticks, not thicker than 25 mm, should be used to allow air circulation (the spacing of the sticks will depend upon the thickness of the boards). The sapwood of stored timber can be damaged by the *Lyctus* powder post beetle. This can be prevented by spraying annually with an appropriate insecticide such as γ HCH. Details of such treatments can be found in PRL Technical Note No. 60, available from Distribution Unit, Building Research Station, Garston, Watford WD2 7JR.

Further information

Advice on marketing of elm is obtainable through the Elm Marketing Group (ELM) c/o Forestry Commission, 25 Savile Row, London W1X 2AY, (telephone (01) 734 4251).

Advice on specific aspects of the use of elm is obtainable from the Princes Risborough Laboratory, Building Research Establishment, Princes Risborough, Aylesbury, Bucks HP17 9PX, (telephone Princes Risborough 3101).

Advice on Dutch elm disease and the felling and removal of diseased trees is obtainable from the Forestry Commission, 231 Corstorphine Road, Edinburgh EH12 7AT, (telephone Edinburgh 334 0303).

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